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COMPARISON OF RADIATION DOSE BETWEEN DIFFERENT X-RAY SYSTEM IN THE CARDIAC CATHETERIZATION LABORATORY: RESULTS FROM BENCH TESTING USING AN ANTHROPOMORPHIC PHANTOM

Poster Contributions
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Authors: *Georgios Christopoulos, Georgios Christakopoulos, Bavana Rangan, Ronald Layne, Rebecca Grabarkewitz, Donald Haagen, Mazen Abu-Fadel, Subhash Banerjee, Emmanouil Brilakis, VA North Texas Health Care System, Dallas, TX, USA*

Background: Advancements in technology have considerably reduced radiation dose during cardiac catheterization. However, differences in radiation dose between various X-ray systems have received limited study.

Methods: An anthropomorphic phantom, used to simulate human tissues, was used in a series of standardized experiments that involved 15 seconds of continuous cineangiography in 7 projections. We evaluated phantom radiation dose with 4 commonly used X-ray systems: Innova IGS (GE Healthcare; Buckinghamshire, United Kingdom.), Integris Allura FD20 (Philips Healthcare; Best, The Netherlands), Allura Clarity (Philips Healthcare; Best, The Netherlands) and Artis one (Global Siemens Healthcare; Erlangen, Germany). Phantom radiation dose was measured with a dedicated X-ray dosimetry system (Gafchromic radiology film and Film QA XR software, Ashland Inc.; Covington, KY, USA), that was pre-calibrated at 0, 1, 2, 3 and 4 Grays. Each experiment was performed in triplicate with each X-ray system.

Results: Significant differences were found in phantom radiation dose with various X-ray systems (Figure).

Conclusion: Radiation dose varies significantly with different types of X-ray equipment, which has important implications for patient and operator safety in the cardiac catheterization laboratory.

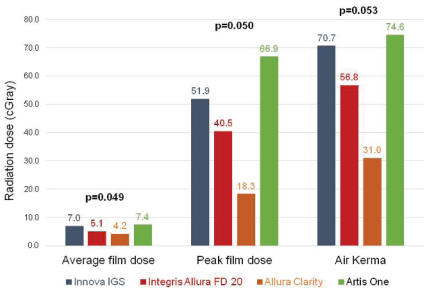

Figure.Comparison of mean film dose, peak film dose and Air kerma dose in 4 fluoroscopy-guided systems.